CLAIMS

1. A waveguide assembly, comprising:

a waveguide embedded in a substrate material; and

a waveguide connector coupled to the embedded waveguide, wherein the waveguide connector has a neck portion disposed transverse to the embedded waveguide and a waveguide channel passing though the neck portion forming a channel between the embedded waveguide and the surface of the substrate material, thereby providing an interface to a surface module.

2. The waveguide assembly of Claim 1, wherein the waveguide connector comprises a base portion formed transverse to said neck portion, wherein the base portion is suitable for stabilising the waveguide connector during a manufacturing process and/or when embedded in the substrate material.

3. The waveguide assembly of Claim 1 or Claim 2, wherein the waveguide connector is made of an inert metal alloy.

4. The waveguide assembly of any preceding Claim, wherein a portion of the neck portion protrudes from the said surface of the substrate material.

5. The waveguide assembly of any preceding Claim, wherein the neck portion is perpendicularly disposed with respect to the embedded waveguide.

6. The waveguide assembly of any preceding Claim, wherein the neck portion comprises one or more formation for providing a connection to a surface component.

7. The waveguide assembly of any preceding Claim, wherein the waveguide channel accommodates at least a portion of the waveguide.

8. The waveguide assembly of any preceding Claim, wherein the embedded waveguide comprises an optical fibre.

9. The waveguide assembly of Claim 8, wherein the optical fibre comprises a fibre mini-bend or tapered bend.

10. The waveguide assembly of any preceding Claim, wherein the substrate material is a composite material.

11. A panel for a vehicle fuselage, component, body or hull, comprising the waveguide assembly according to any one of Claims 1 to 10.

12. A vehicle comprising a panel according to Claim 11.

13. A method of manufacturing a vehicle, comprising incorporating a panel according to Claim 11 into a vehicle fuselage, component, body or hull.

14. A surface module for interfacing to the waveguide assembly according to any one of Claims 1 to 10.

15. A waveguide connector for interfacing a waveguide embedded in a substrate material to a surface module, the waveguide connector comprising a neck portion for disposing transverse to an embedded waveguide and a waveguide channel passing though the neck portion for forming a channel between the embedded waveguide and a surface of a substrate material.

16. The waveguide connector of Claim 15, wherein the waveguide connector comprises a base portion formed transverse to said neck portion.

17. The waveguide connector of Claim 15 or Claim 16, wherein the waveguide connector is made of an inert metal alloy.

18. The waveguide connector of Claim 16 or Claim 17, wherein the neck portion extends perpendicularly from the base portion.

19. The waveguide connector of any one of Claims 15 to 18, wherein the neck portion comprises one or more formation for providing a connection to a surface component.

20. The waveguide connector of any one of Claims 15 to 19, wherein the waveguide channel is for accommodating at least a portion of a waveguide.

21. A method of manufacturing a waveguide assembly, comprising:

coupling a waveguide connector to a waveguide; and

embedding the waveguide connector and the waveguide in a substrate material, wherein the waveguide connector has a neck portion disposed transverse to the waveguide and a waveguide channel passing though the neck portion for forming a channel between the waveguide and the surface of the

substrate material, thereby providing an interface from an embedded waveguide to a surface module.

22. The method of Claim 21, comprising capping the waveguide connector prior to embedding the waveguide connector in the substrate material.

23. The method of Claim 21 or Claim 22, wherein the step of embedding the waveguide connector and the waveguide in a substrate material comprises providing a plurality of composite material layers to form the substrate material, each composite material layer surrounding the neck portion of the waveguide connector.

24. The method of Claim 23, wherein each composite material layer comprises respectively aligned material fibres.

25. The method of Claim 24, further comprising selecting the material fibres from one or more of the following materials: carbon, glass, metal and Kevlar.

26. A waveguide assembly substantially as hereinbefore described with reference to the accompanying drawings.

27. A panel substantially as hereinbefore described with reference to the accompanying drawings.

28. An aircraft substantially as hereinbefore described with reference to the accompanying drawings.

29. A method of manufacturing an aircraft substantially as hereinbefore described with reference to the accompanying drawings.

30. A surface module substantially as hereinbefore described with reference to the accompanying drawings.

31. A waveguide connector substantially as hereinbefore described with reference to the accompanying drawings.